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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/634,912 08/09/00 SHIMOJOH

N 1344.1043/JD

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WASHINGTON DC 20001

PM82/0820

EXAMINER

CUNNINGHAM, S

ART UNIT

PAPER NUMBER

3

3662

DATE MAILED:

08/20/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/634,912

Applicant(s)

SHIMOJOH ET AL.

Examiner

Stephen C. Cunningham

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— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 August 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 2, and 5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Indefinite language causes the failure to particularly point out and distinctly claim the invention. In claim 1, line 9 the wording "by supplying" leads to ambiguity in the material being claimed. Is the matter following "by supplying" being claimed as part of the invention as a means or merely intended use? Claim 2, line 12 and claim 5, line 12 have similar language.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma in view of Grubb.

Ma teaches an excitation light for Raman amplifier 302 and erbium doped fiber amplifiers 304 but fails to teach the same pump wavelength for both the Raman amplifier and erbium doped fiber amplifier. Grubb teaches in figure 5, a laser 56 excites

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both rare earth element (erbium) doped fiber and Raman amplification producing medium using the same wavelength. It would have been obvious to modify Ma to include an excitation laser downstream of the erbium doped amplifier where in said excitation light produces a wavelength capable of both producing Raman amplification and exciting the rare earth doped fiber as taught by Grubb to make Ma's device more useful for long distance communications.

With respect to claim 3, it would have been obvious to use a 1480nm band excitation light to pump a 1550nm band signal in a Raman amplification producing medium and a rare earth element doped fiber because, 1480nm is the standard wavelength used both to pump an erbium doped fiber amplifier and to pump a Raman amplification producing medium for a 1550nm band signal.

With respect to claim 8, it is well known in the art that an optical fiber designed with the non-linear effective cross section reduced compared to a 1.3 μ m zero dispersion single mode fiber facilitates Raman amplification. It would have been obvious to modify the device to use an optical fiber designed with the non-linear effective cross section reduced compared to a 1.3 μ m zero dispersion single mode fiber for a Raman amplification producing medium.

Claims 5, 6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma in view of Grubb as applied to claim 2 above, and further in view of Mitsuda. Ma in view of Grubb fails to teach a second amplification stage where only one band of the signal light is amplified by means of a demultiplexer separating the first wavelength band into a non-amplifying section and the second wavelength band into an amplifying

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section. Mitsuda teaches, in figure 1, a preamplifier for amplifying both the first signal 51 and second signal 53 and a second erbium doped fiber amplifier 33 for amplifying only the second signal 53. It would have been obvious to further modify Ma to have a first stage amplifying section leading to demultiplexing means leading to a second stage amplifying means for amplifying only the second wavelength band in order to limit the active components needed for flattened gain amplification.

With respect to claim 6, it would have been obvious to use a 1480nm band excitation light to pump a 1550nm band signal in a Raman amplification producing medium and a rare earth element doped fiber because, 1480nm is the standard wavelength used both to pump an erbium doped fiber amplifier and to pump a Raman amplification producing medium for a 1550nm band signal.

With respect to claim 7 Ma and Grubb fail to teach a pre-stage optical amplifying section comprising an erbium doped fiber. Mitsuda teaches, in figure 1, a pre-stage optical amplifying section 32 comprising an erbium doped fiber. It would have been obvious to further modify Ma to include to an erbium doped fiber amplifier as part of the pre-amplification stage to raise the gain up to the level of the device in claims 1-4.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ma in view of Grubb as applied to claim 1 above, and further in view of Watanabe. Ma and Grubb fail to teach the hybrid transmission path where alternating sections of optical fiber having positive and negative wavelength dispersion values compensate for each other. Watanabe teaches that alternating sections of optical fiber having positive and negative wavelength dispersion values compensate for each other. It would have been

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obvious to further modify Ma to use a hybrid transmission path where alternating sections of optical fiber having positive and negative wavelength dispersion values compensate for each other for the external transmission path to increase the length and capacity of the optical fiber.

Claim 10, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma in view of Grubb as applied to claim 1 above, and further in view of Kosaka US006229641B1. Ma and Grubb fail to teach the use of control means. Kosaka teaches the use of power constant control means. It would have been obvious to further modify Ma to add power constant control means to an optical amplifier as in Claim 10. Kosaka teaches the use of gain constant control means. It would have been obvious to add gain constant control means to an optical amplifier as in Claim 11. Kosaka teaches the use of supervisory control means for processing a supervisory control (probe) signal transmitted together with the wavelength division multiplexed signal light. It would have been obvious to add supervisory control means to an optical amplifier as in Claim 12.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mitsuda in view of Ma. Mitsuda, in figure 1, teaches all of claim 13 except multiplexing means for combining the amplified signals 52 and 54. Ma teaches a multiplexing device for combining amplified signals. It would have been obvious to modify Mitsuda by including multiplexing means in order to carry both signals on the same fiber.

Claim 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitsuda in view of Ma as applied to claim 13 above, and in further view of Kosaka.

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Mitsuda and Ma fail to teach the use of power monitor means and the use of power control means. Kosaka teaches the use of power monitor means and the use of power constant control means. It would have been obvious to further modify Mitsuda add power monitor means and power constant control means to an optical amplifier. Kosaka teaches the use of control means for correcting the difference between the output signals of different wavelengths.

With respect to claim 16, Mitsuda and Ma fail to teach power constant control means. Kosaka teaches the use of power constant control means. It would have been obvious to include in an optical amplifier power constant control means.

With respect to claim 17 Mitsuda and Ma fail to teach gain constant control means. Kosaka teaches the use of gain constant control means. It would have been obvious to include gain constant control means in an optical amplification device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen C. Cunningham whose telephone number is 703-605-4275. The examiner can normally be reached on M - F, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Tarcza can be reached on 703-306-4171. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7687 for regular communications and 703-305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-4180.

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August 16, 2001

A handwritten signature in black ink, reading "Thomas H. Tarcza". The signature is written in a cursive style with a large, stylized 'T' and 'H'.

THOMAS H. TARCZA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600